



Revision of the genus *Neocyrtopsis* Liu & Zhang (Orthoptera: Tettigoniidae: Meconematinae)

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Abstract

In this paper we describe a new subgenus *Neocyrtopsis* (*Paraneocyrtopsis*) with two species originally described in *Acosmetura* Liu, 2000. We redescribe all the species in the subgenus *Neocyrtopsis*, and provide a key. Materials are deposited in the Shanghai Entomological Museum, CAS (SEM).

Key words: Meconematinae, *Neocyrtopsis* (*Paraneocyrtopsis*), new subgenus

Introduction

The genus *Neocyrtopsis* was proposed by Liu and Zhang in 2007 as a subgenus of *Cyrtopsis* Bey-Bienko, 1962, given generic status by Wang and Liu in 2012 on the basis of the hind tibiae bearing 3 pairs of apical spurs and the male epiproct fused to the 10th abdominal tergite. Some species of *Acosmetura* Liu, 2000 also bear these characters. As a result *Acosmetura yachowensis* (Tinkham, 1944) and *Acosmetura bilobata* Liu, Zhou & Bi, 2008 seem close to species *Neocyrtopsis fallax* Wang & Liu, 2012, especially since epiproct is well developed and fused with preceding tergite. This is very different from other species of *Acosmetura* in that the male 10th abdominal tergite, but body size and pronotum are different from other species of *Neocyrtopsis*, upon that basis we propose a new subgenus of *Neocyrtopsis* for these two species. We redescribe them and the other species of *Neocyrtopsis* and provide a new key. Moreover, the species *Acosmetura platycata* (Shi & Zheng, 1994) likely belongs to this new subgenus on the basis of the to male 10th abdominal tergite. However, the male subgenital plate is very different from *Neocyrtopsis*, and we lack specimens to propose a transfer, thus the taxonomic status of this species deserves further study.

Neocyrtopsis Liu & Zhang, 2007

Cyrtopsis (*Neocyrtopsis*) Liu & Zhang, 2007. Entomotaxonomia, 29(2): 89.

Neocyrtopsis Wang, et al., 2012. Zootaxa 3521: 51–58.

Type species: *Cyrtopsis variabilis* Hsia & Liu, 1993

Body small. Form brachypterous. Fastigium of vertex blunt conical and dorsally grooved, last segment of maxillary palps distinct longer than the preceding one. Pronotum of male large, metazona considerably elevated and expanded, with low pleurite and oblique hind margin, without humeral sinus. Tegmina shorter than pronotum, mostly concealed beneath pronotum, with stridulatory file in male. Fore coxae with spine, each femora unarmed, auditory of tibiae open on both sides, fore and mid tibiae with movable spines on each margin of ventral surface, lower lobe of hind knee with or without spine, hind tibiae with 3 pairs of apical spurs. Male 10th abdominal tergite

with a pair of lateral lobes; epiproct well developed and fused with preceding tergite; concealed genitalia sclerotised and exposed; posterior margin of subgenital plate without projection. Ovipositor with margins smooth.

Key to all known species of *Neocrytopsis*

1. Metazona of male considerably elevated and expanded, genitalia not protruding (Figs. 2, 6).....*Neocrytopsis (Neocrytopsis) Liu & Zhang, 2007*...2
- Metazona of male flat not expanded, genitalia protruding (Figs. 11, 15)....*Neocrytopsis (Paraneocrytopsis) subgen. nov.*...3
2. Genicularlobe of male with a spine; male epiproct quadrate. Female unknown*Neocrytopsis (Neocrytopsis) variabilis (Hsia & Liu, 1993)*
- Genicular lobe of male without spine; male epiproct triangular. Female subgenital plate as Fig. 9.....*Neocrytopsis (Neocrytopsis) fallax Wang & Liu, 2012*
3. Male and female of subgenital plate with hind margin truncate (Figs.13–14).....*Neocrytopsis (Paraneocrytopsis) yachowensis (Tinkham, 1944) comb. nov.*
- Male and female of subgenital plate with hind margin notched or concave (Figs. 17–18).....*Neocrytopsis (Paraneocrytopsis) bilobata (Liu, Zhou & Bi, 2008) comb. nov.*

Neocrytopsis (Neocrytopsis) Liu & Zhang, 2007

Cyrtopsis (Neocrytopsis) Liu & Zhang, 2007. Entomotaxonomia, 29(2): 89.
Neocrytopsis Wang, et al., 2012. Zootaxa 3521: 51–58.

Type species: *Cyrtopsis variabilis* Hsia & Liu, 1993

Body large for brachypterous members of the Meconematini; metazona considerably elevated and expanded. Male epiproct well developed and fused with 10th abdominal tergite; genitalia exposed and not protruding, subgenital plate with styles. Ovipositor margins smooth.

Neocrytopsis (Neocrytopsis) variabilis (Hsia & Liu, 1993)

(Figs. 1–4)

Cyrtopsis variabilis Hsia & Liu, 1993. In Huang: Insects of Wuling Mountains area, South Western China: 95; Jin & Xia, 1994. Jour. Orth. Res., 3(1): 26.

Cyrtopsis (Neocrytopsis) variabilis Liu & Zhang, 2007. Entomotaxonomia, 29(2): 89–90.

Neocrytopsis variabilis Wang, et al., 2012. Zootaxa 3521: 51–58.

Description. Male. Tegmina reaching middle of second abdominal tergite. Fore tibiae spines type 4, 4 (1, 1). Middle tibiae with 3 inner and 5 outer spines excluding apical spurs, hind tibiae with 18–21 dorsal teeth each margin above and 3 pairs of apical spurs, lower genicular lobe of hind femur with spine. 10th abdominal tergite broad, median hind margin merged with epiproct, merged portion quadrate (Figs. 1–2). Cerci long and slender, without branches, apical with inner surface excavated and apex hooked inwards (Figs. 1–3). Genitalia exposed and not protruding (Figs. 2–3). Subgenital plate longer than wide, hind margin middle notched (Fig. 4), styles on both sides of hind margin.

Female unknown.

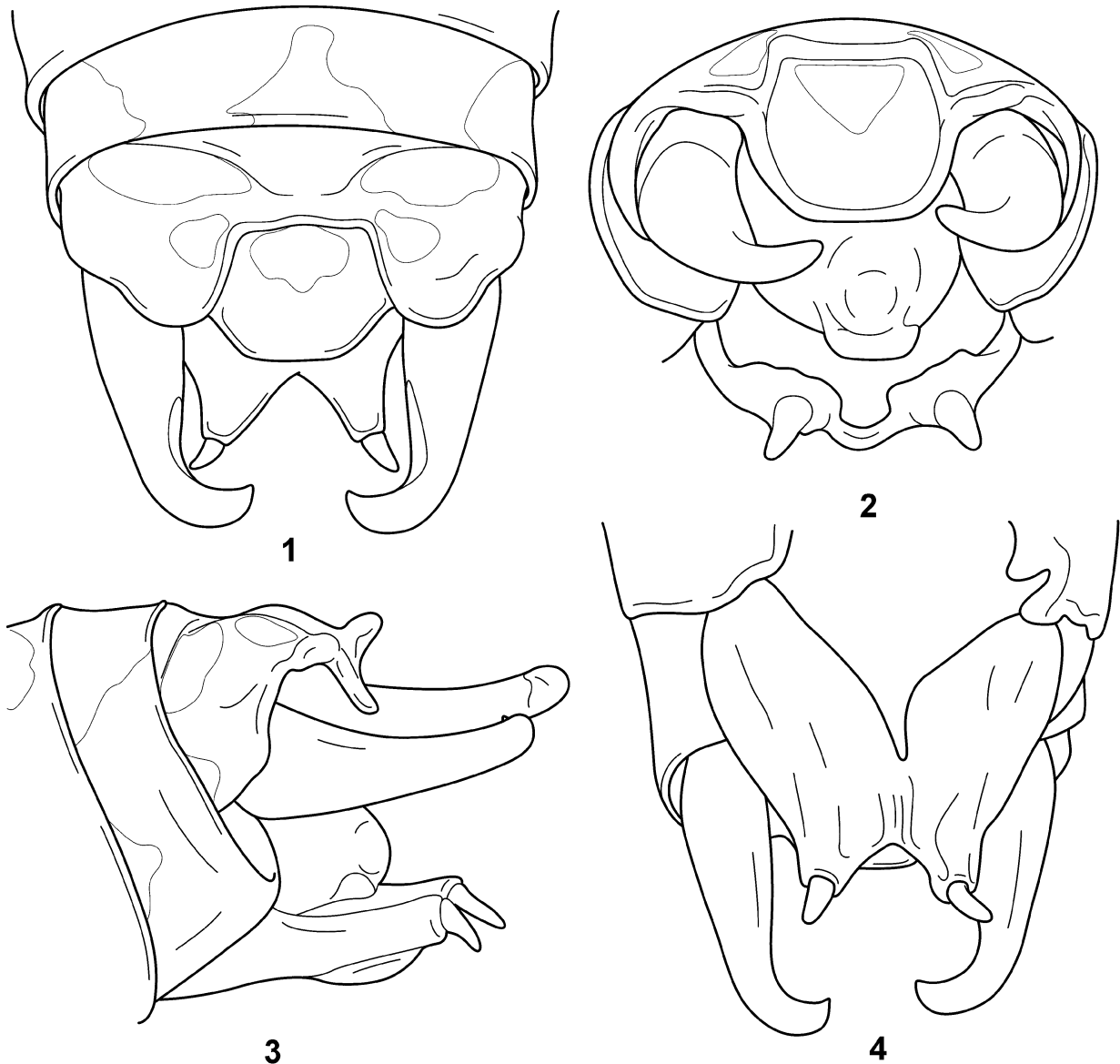
Coloration. Yellowish brown variegated blackish brown. Fastigium of vertex pale, antennae with darkish rings, prozona with yellow markings on each side. Subapex of each tegmina with a darkened marking. Abdomen with black brown markings. Apex of fore and middle tibiae, all tarsus darkened.

Measurements. (in mm)

	Body	Pronotum	Tegmina	Hind femora	Ovipositor
♂	14.0	7.0	2.0	13.5–14.5	/

Material. 1 ♀, China: Guizhou, Leishan county, Leigong mountain, 1988.IV.30, leg. LIU Zu-yao.

Distribution. China (Guizhou).



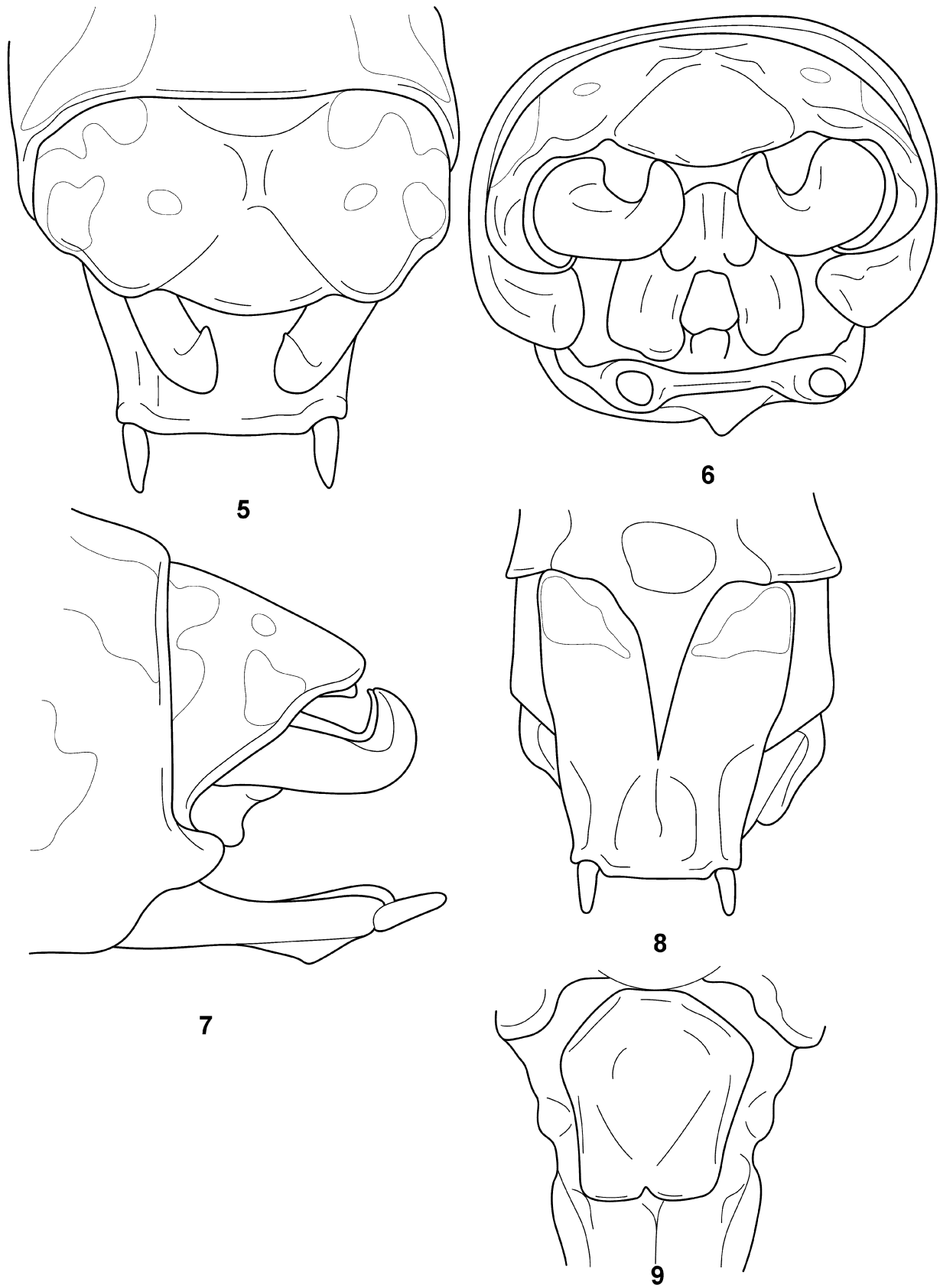
FIGURES 1–4. *Neocryptopsis (Neocryptopsis) variabilis* (Hsia & Liu, 1993). **1.** Tip of male abdomen, dorsal view; **2.** Tip of male abdomen, rear view; **3.** Tip of male abdomen, lateral view; **4.** Tip of male abdomen, ventral view.

***Neocryptopsis (Neocryptopsis) fallax* Wang & Liu, 2012**

(Figs. 5–9)

Neocryptopsis fallax Wang, et al., 2012. Zootaxa 3521: 51–58.

Description. Male. Tegmina reaching end of second abdominal tergite. Fore tibiae spines type 4, 4 (1, 1). Middle tibiae with 4 inner and 5 outer spines excluding apical spurs; hind tibiae with 18–20 dorsal teeth each margin above and 3 pairs of apical spurs, genicular lobe unarmed. 10th abdominal tergite broad, merged with epiproct more completely, boundary vague and merged portion acute (Fig. 5). Cerci slender, without branches, apex with dorsal surface flat and hooked upwards (Figs. 5–7). Genitalia exposed and not protruding (Figs. 6–7). Subgenital plate longer than wide, hind margin truncate (Fig. 7), styles on both sides of hind margin.



FIGURES 5–9. *Neocryptopsis (Neocryptopsis) fallax* Wang & Liu, 2012. **5.** Tip of male abdomen, dorsal view; **6.** Tip of male abdomen, rear view; **7.** Tip of male abdomen, lateral view; **8.** Tip of male abdomen, ventral view; **9.** Subgenital plate of female, ventral view.

Female. Tegmina reaching cephalic margin of first abdominal tergite, laterally situated. Cerci long, conical. 10th abdominal tergite median notched, epiproct trapezoidal. Subgenital plate with basal half widened, apical half narrow, hind margin with a median notch (Fig. 9). Ovipositor shorter than hind femur, apical half curved upwards, margins smooth.

Coloration. Yellowish brown variegated blackish brown. Head with paired yellow stripes behind eyes, antennae with darkish rings, prozona with blackish brown markings on each side. Abdomen with paired longitudinal bands dorsally. All legs with pale brown markings and spines darkened.

Measurements. (in mm)

	Body	Pronotum	Tegmina	Hind femora	Ovipositor
♂	12.7	6.5	3.0	10.6	/
♀	10.0–10.6	4.0–4.7	1.0–2.3	10.2–10.4	6.4–7.0

Material. 1 ♂, 1 ♀, China: Sichuan, Tianquan, Laba River, Alt. 2060m, 2007.VII.28–30, leg. LIU Xian-Wei, ZHANG Feng, ZHOU Min, BI Wen-Xuan; 1 ♀, China: Sichuan, Shimian, Gongyihai, Alt. 2100m, 2007.VII.22–25, leg. LIU Xian-Wei, ZHANG Feng, ZHOU Min, BI Wen-Xuan.

Discussion. This species is very similar to *Neocyrtopsis* (*N.*) *variabilis* (Hsia & Liu, 1993), but genicular spine absent and male epiproct merged more complete with 10th abdominal tergite and boundary angular. The cerci are shorter and hooked upwards, pronotal markings different.

Distribution. China (Sichuan).

Neocyrtopsis (*Paraneocyrtopsis*) **Wang, Liu & Li, subgen. nov.**

Type species: *Xiphidiopsis yachowensis* Tinkham, 1944

Smaller sized. Pronotum of male smaller, metazona flat not expanded. Epiproct well developed and fused with male 10th abdominal tergite, genitalia exposed and protruded, can be viewed dorsally. Subgenital plate with styles. Ovipositor margins smooth.

This subgenus contrasts with the nominotypical subgenus in its smaller body size, flat metazona of pronotum, and protruding genitalia that can be viewed dorsally.

Neocyrtopsis (*Paraneocyrtopsis*) *yachowensis* (Tinkham, 1944) **comb. nov.**

(Figs. 10–14)

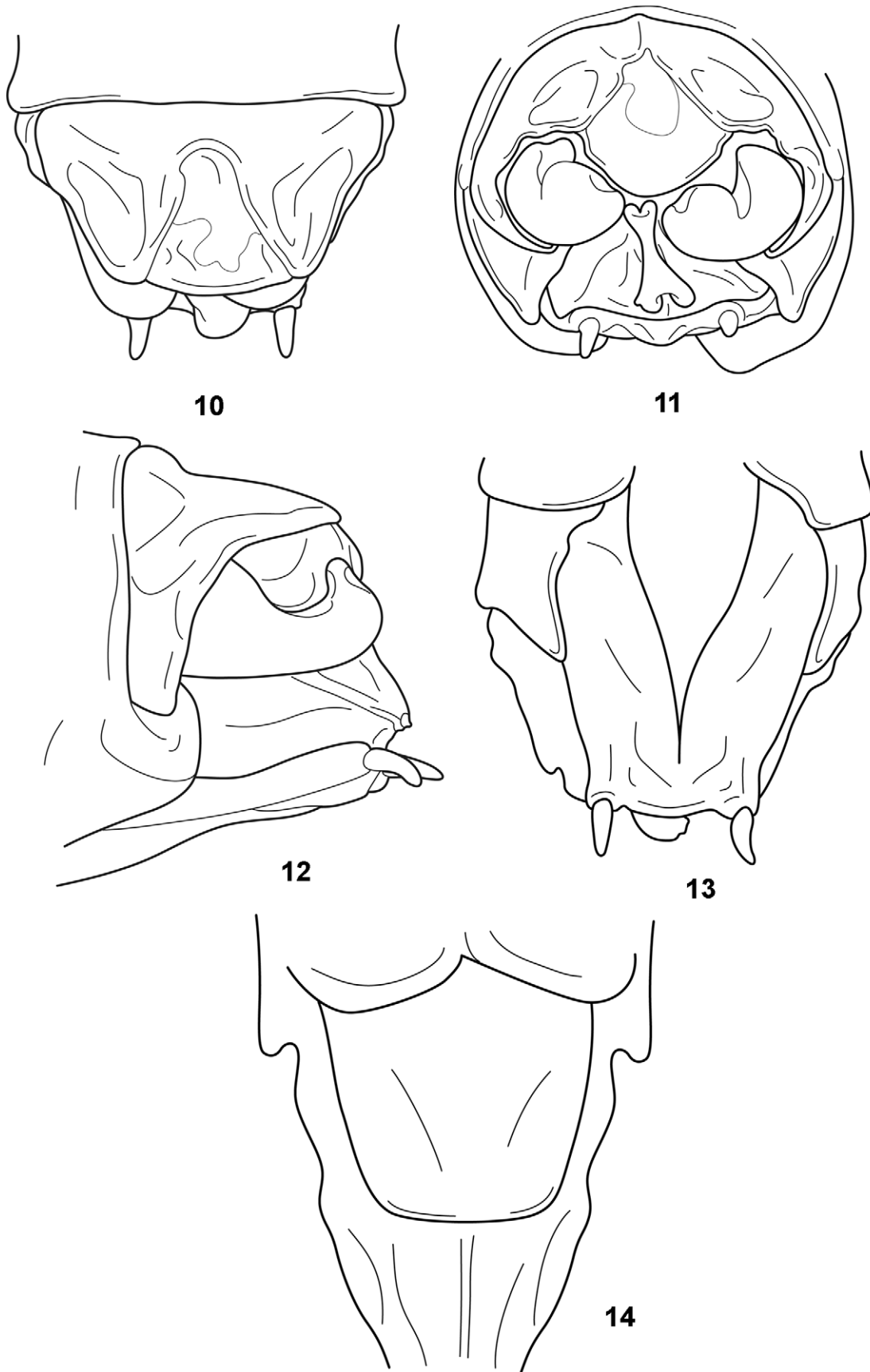
Xiphidiopsis yachowensis Tinkham, 1944. Proc. U. S. Nat. Mus., 94: 509.

Thaumaspis yachowensis Bey-bienko, 1957. Ent. Obozr. Moscow, 36: 412; Liu & Jin, 1994. Contr. Shanghai Inst. Entomol., 11: 109; Jin & Xia, 1994. Jour. Orth. Res., 3: 26.

Acosmetura yachowensis Liu & Zhou. 2007. Acta Zootaxonomica Sin., 32: 193.

Description. Male. Tegmina reaching fore part of second abdominal tergite, exceeding distal margin of pronotum; hind margin rounded. Fore tibiae spines type 3, 3 (1, 1). Middle tibiae with 3 inner and 4 outer spines excluding apical spurs, hind tibiae with 14–20 dorsal teeth each margin above and 3 pairs of apical spurs. 10th abdominal tergite little longer, merged with epiproct, boundary clear and fused portion acute (Figs. 10–11). Cerci short and robust, concealed beneath 10th abdominal tergite, without branches, middle slender, apex bent upwards, expanded and flat (Figs. 11–12). Genitalia protruding and apically compressed (Figs. 11–12). Subgenital plate long and narrow, hind margin truncate (Fig. 13), styles smaller on both sides of hind margin.

Female. Tegmina reach mid part of second abdominal tergite, exceeding distal margin of pronotum, laterally situated. Cerci long, conical. 10th abdominal tergite median notched, epiproct triangular. Subgenital plate with base widened, hind part narrower, hind margin rounded truncate, middle concave slightly (Fig. 14). Ovipositor shorter than hind femur, apical half curved upwards, margins smooth.



FIGURES 10–14. *Neocyrtopsis (Paraneocyrtopsis) yachowensis* (Tinkham, 1944) comb. nov. **10.** Tip of male abdomen, dorsal view; **11.** Tip of male abdomen, rear view; **12.** Tip of male abdomen, lateral view; **13.** Tip of male abdomen, ventral view; **14.** Female subgenital plate, ventral view.

Coloration. Unicolorous, pale brown, probably foliage green in life, antennae with darkish rings, dorsal surface of pronotum with 2 pale stripes.

Measurements. (in mm)

	Body	Pronotum	Tegmina	Hind femora	Ovipositor
♂	10.0–10.7	4.2–4.5	1.0	8.1–8.9	/
♀	11.7–12.1	4.4–4.7	1.2	9.0–9.1	6.0–6.1

Material. 5♂♂, 3♀♀, China: Sichuan, Luding country, Moxi town, Alt. 2100m, 2006.VII.30, leg. ZHOU Shun.

Distribution. China (Sichuan).

***Neocyrtopsis (Paraneocyrtopsis) bilobata* (Liu, Zhou & Bi, 2008) comb. nov.**

(Figs. 15–18)

Acosmetura bilobata Liu, Zhou & Bi. 2008. Acta Zootaxonomica Sin., 33(4): 761.

Description. Male. Tegmina reaching middle of first abdominal tergite, not exceeding distal margin of pronotum, hind margin truncate. Fore tibiae spines type 3, 3 (1, 1). Middle tibiae with 3 inner and 4 outer spines excluding apical spurs, hind tibiae with 26–28 dorsal teeth each margin above and 3 pairs of apical spurs. 10th abdominal tergite not transverse, merged with epiproct, boundary clear and merge part pointed (Fig. 15). Cerci short, concealed beneath 10th abdominal tergite, without branches, base thick-set spherically, apex hooked and directed upwards (Fig. 16). Genitalia protruding, apex flat (Figs. 15–16). Subgenital plate longer than wide, hind margin media notched (Fig. 17), styles smaller on both sides of hind margin.

Female. Tegmina reach hind part of first abdominal tergite, laterally situated. Cerci long, conical. 10th abdominal tergite median notched, epiproct semicircular. Subgenital plate with base widened, hind margin middle concaved (Fig. 18). Ovipositor shorter than hind femur, apical half curved upwards, margins smooth.

Coloration. Greenish, antennae with darkish rings, dorsal surface of prozona with a brown band which edge pale. Abdomen with a brown band dorsally. Outer surface of hind femora with brown oblique stripes.

Measurements. (in mm)

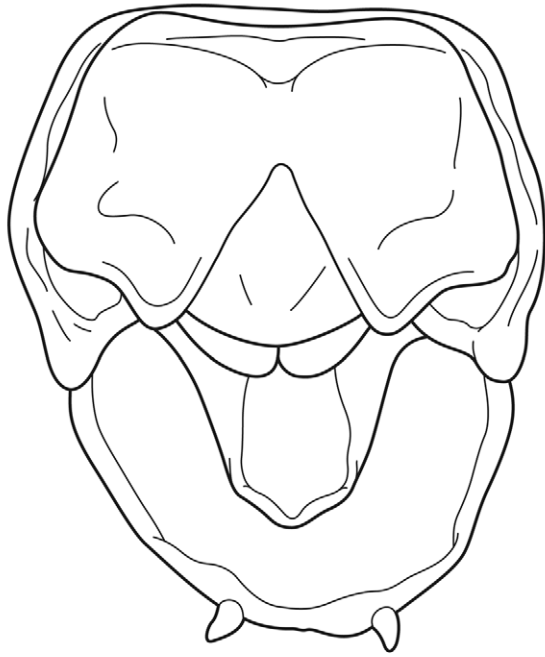
	Body	Pronotum	Tegmina	Hind femora	Ovipositor
♂	9.0–10.0	3.5–4.0	1.0	7.1–7.5	/
♀	10.0–12.0	3.3–3.5	0.8	8.5–9.0	6.1–6.5

Material. 9♂♂, 14♀♀, China: Sichuan, Tianquan country, Laba River, Alt. 2000m, 2007.VII.28, leg. LIU Xian-Wei, ZHANG Feng, ZHOU Min, BI Wen-Xuan.

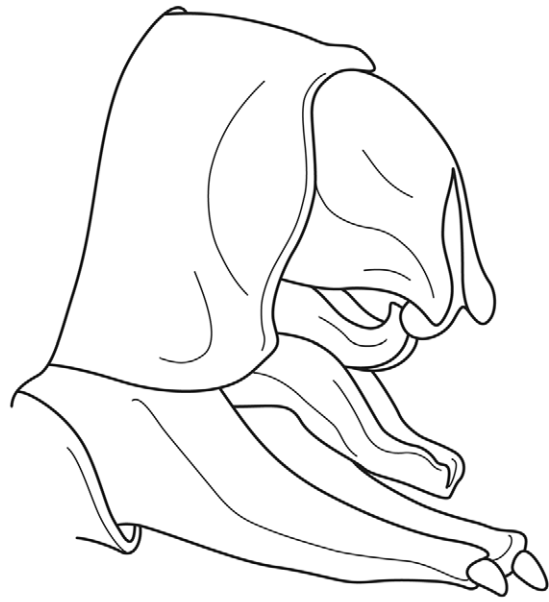
Discussion. This species very similar to the type species of this subgenus, but can distinguished by cerci slender, genitalia apex flat, subgenital plate broader, hind margin notched.

Distribution. China (Sichuan).

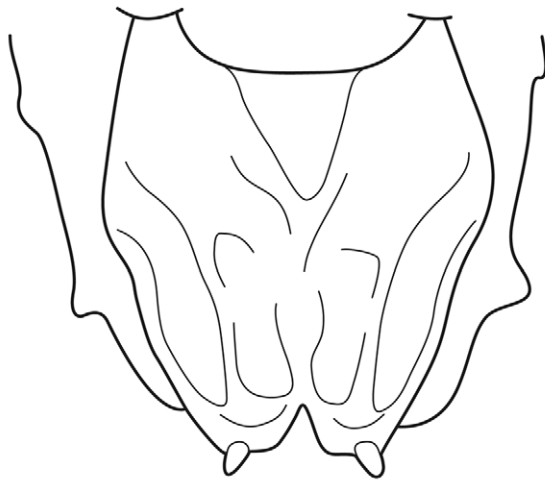
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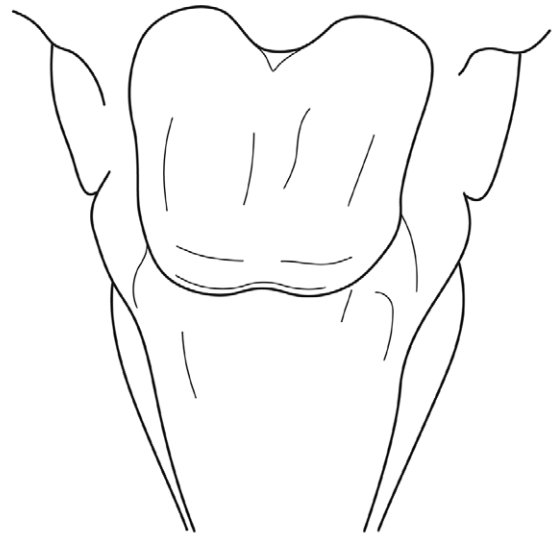
15



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17



18

FIGURES 15–18. *Neocyrtopsis (Paraneocyrtopsis) bilobata* (Liu, Zhou & Bi, 2008) comb. nov. **15.** Tip of male abdomen, rear view; **16.** Tip of male abdomen, lateral view; **17.** Tip of male abdomen, ventral view; **18.** Female subgenital plate, ventral view.

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